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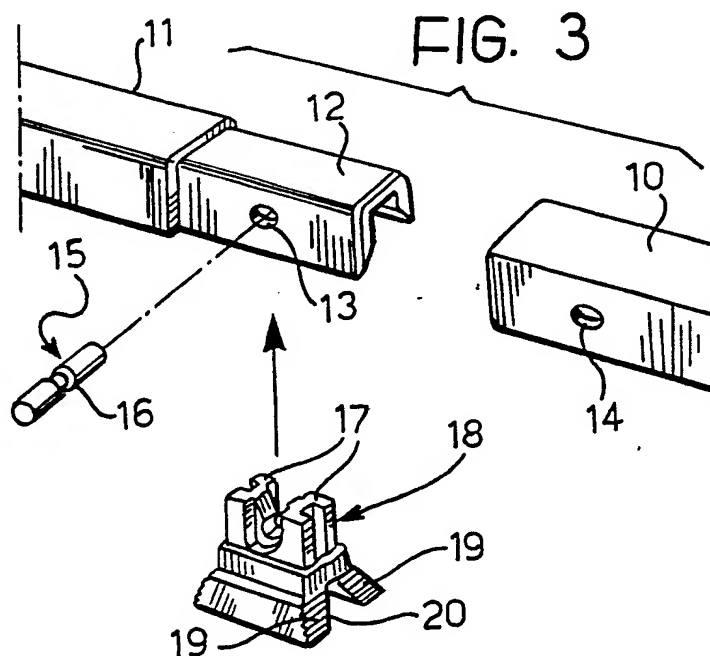
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UK CL (Edition K) **A4F FAE**

INT CL<sup>5</sup> **B60S 1/34 1/40 1/42**

## (54) Windscreen wiper arms

(57) Wiper unit for windscreen-wiper devices for motor vehicles, comprising an arm (2) Fig 1 (not shown) intended to be connected at one end (3) to a motorized control device and bearing at the other end (11) a blade assembly (5) which is permanently connected to the arm. The arm is sub-divided into two longitudinal sections 10, 11 connected to one another by means of an insertion-type joint 12 and a removable restraining means formed of a pin 15 and a deformable snap-on clip 18.



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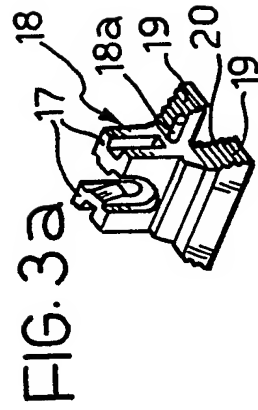
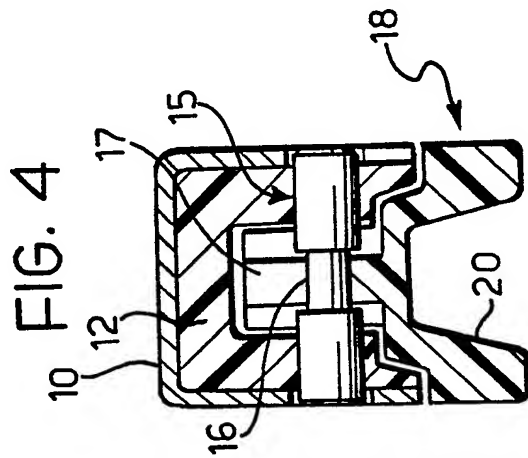
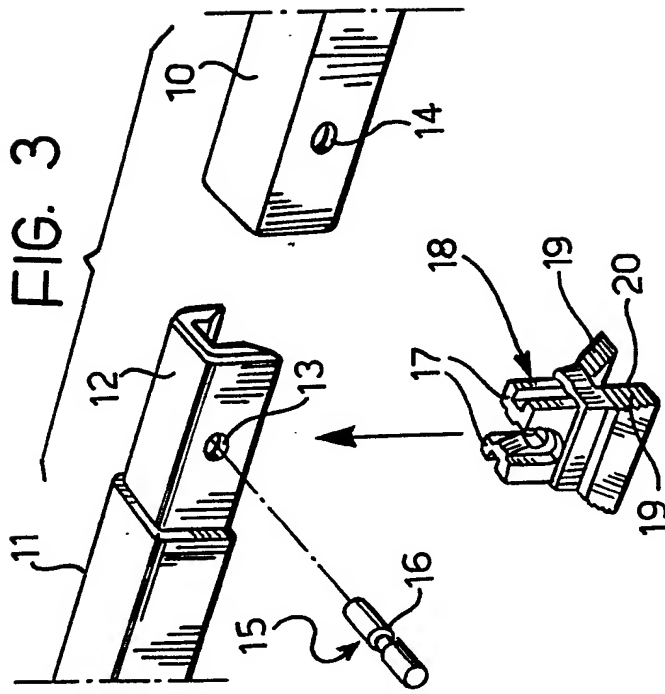
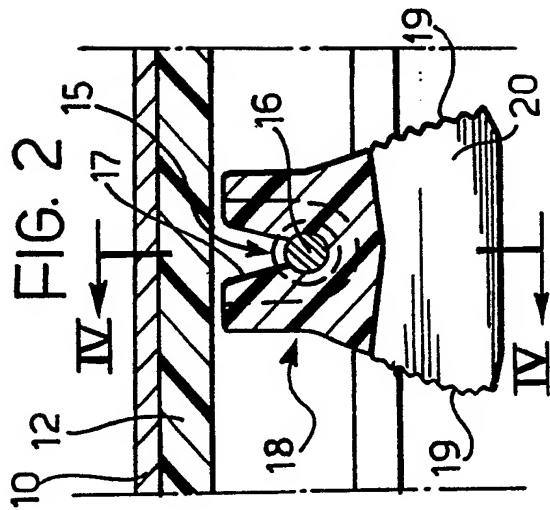
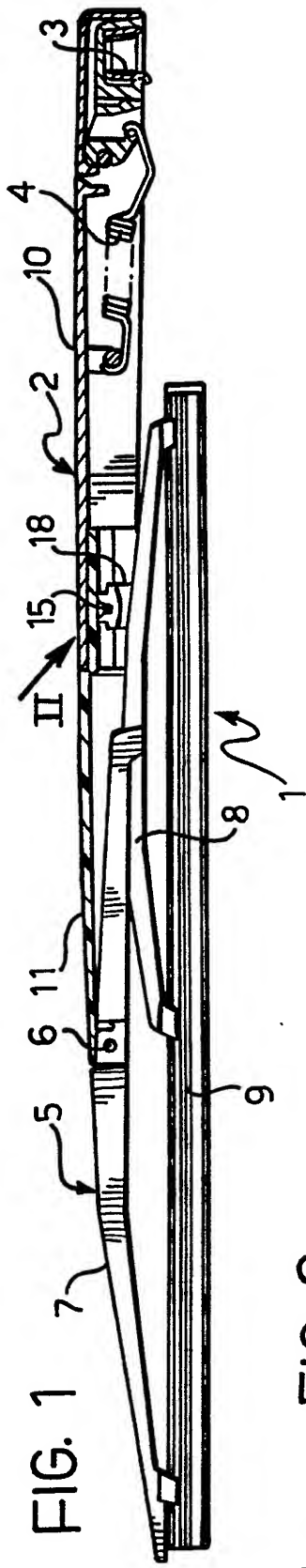


FIG. 5

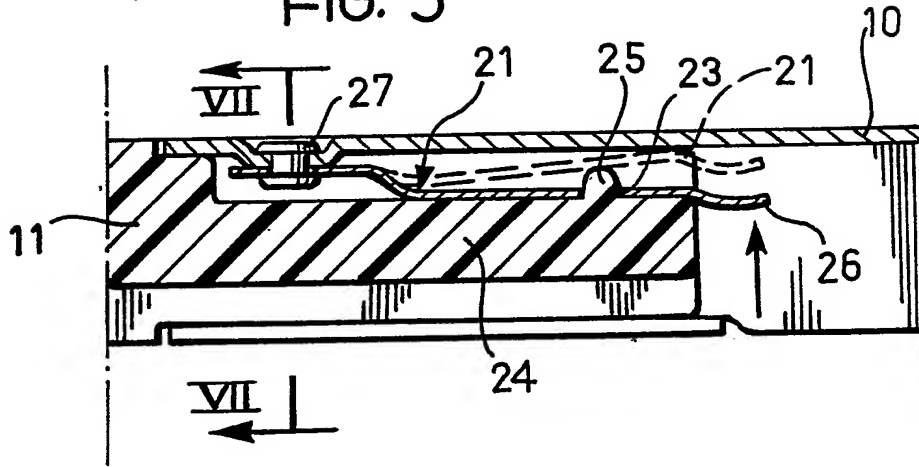


FIG. 6

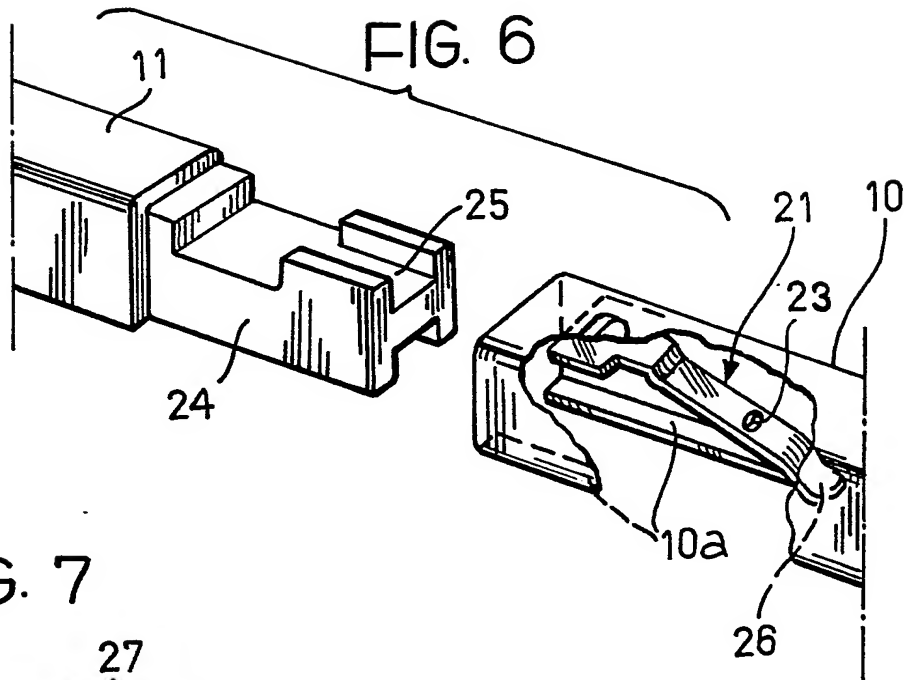
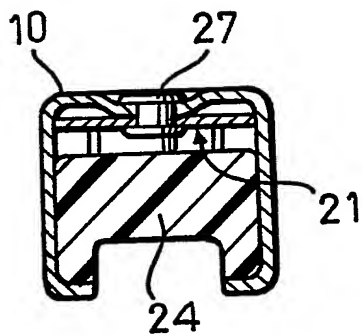


FIG. 7



Wiper Unit for Windscreen Wiper Devices of Motor Vehicles

5 The present invention relates to a wiper unit for windscreen-wiper devices for motor vehicles or similar, comprising an arm intended to be connected at one end to a motorized control device and bearing at the other end a wiper blade assembly.

10 In the majority of known wiper units of the type defined above, the wiper blade assembly is connected to the arm in a removable manner in order to allow its possible replacement. Recently there have appeared on the market similar wiper units in which the blade assembly is not removable but is permanently connected to the arm. In these units, the restoration of the functioning of the blade assembly in the event of wear is brought about simply by demounting and replacing the rubber wiper blade  
15 of the blade assembly.

A wiper unit of this type is known for example from the Italian utility model application no. 53549-B/87 in the name of the same Applicant.

20 The aim of the invention is to produce a wiper unit of the abovementioned type, which has a lighter and more compact structure in relation to known wiper units, and which is therefore particularly suitable for application to single-arm windscreen-wiper devices, and which is furthermore planned to render more convenient, practical  
25 and easy the operations for replacement of the wiper blade assembly in the event of wear.

30 According to the invention, this aim is achieved by virtue of the fact that the arm is sub-divided into two longitudinal sections connected to one another by means of an insertion-type joint and interconnected by removable restraining means.

35 This solution idea makes it possible to produce the arm using different materials: metal for the supporting section, that is to say that which is intended to be connected to the motorized control device, and plastic material for the section to which the blade assembly is permanently connected, which also has a structure made of plastic material. It is thus possible to reduce appreciably the mass of the entire wiper unit, which can

therefore advantageously be used for single-arm windscreen-wiper devices which are operated even at high angular velocity across wiping fields having a size of close to 180°.

5       The insertion-type connection between the two sections of the arm guarantees it the necessary qualities of rigidity and structural robustness, making the operations of removal and replacement of the section supporting the wiper blade assembly extremely easy and  
10       quick.

      According to a first embodiment of the invention, the two sections of the arm have profiles in the form of a channel which are mutually engaged in a telescopic manner and said removable restraining means consist of a  
15       transverse pin for joining the two sections, which is formed with a central circumferential groove on which there engages by means of a snap connection an elastic retention fork which is formed in a restraining element inserted into the cavity of the arm.

20       This restraining element advantageously has a grip part which is profiled in the form of a channel and projects from the back of the arm, facilitating the operation of its disengagement from the pin, in order to allow its extraction and the subsequent demounting of the  
25       section of the arm bearing the blade assembly, as well as the subsequent remounting of a new section with wiper blade assembly.

      According to an alternative of the invention, one of the two sections of the arm has a profile in the form of a channel on the inside of which a retention element in  
30       the form of a resilient strip, which is provided with a locking part, is fixed, and the other section of the arm engages in a telescopic manner in this profile in the form of a channel and has a locating part which can be  
35       engaged by the locking part of the retention strip.

      This retention strip conveniently has one end for manoeuvring which is accessible from the cavity of said section with a profile in the form of a channel in order to disengage said locking and locating parts.

The invention will now be described in detail with reference to the attached drawings which are provided only by way of non-limitative example and in which:

5       Figure 1 is a schematic view in partial longitudinal cross-section of a wiper unit according to the invention,

      Figure 2 illustrates on enlarged scale the detail indicated by the arrow II in Figure 1,

      Figure 3 is an exploded perspective view of Figure 2,

10       Figure 3a shows an alternative of a detail of Figure 3,

      Figure 4 is a view in transverse cross-section according to the line IV-IV in Figure 2,

      Figure 5 shows an alternative of Figure 2,

15       Figure 6 is an exploded perspective view of Figure 5, and

      Figure 7 is a view in transverse cross-section according to the line VII-VII in Figure 5.

20       With reference to Figures 1 to 4, 1 generically indicates a wiper unit according to the invention for windscreen-wiper devices of motor vehicles and similar.

25       The wiper unit 1 comprises an arm 2 which has at one end an articulated mounting head 3 for the insertion of the operating shaft (not illustrated) of a known motorized control device. An elastic element 4 tends, also in known manner, to maintain the head 3 and the arm 2 in the state of mutual alignment represented in Figure 1.

30       At the other end, the arm 2 bears a wiper blade assembly 5 which is permanently connected to it by means of an articulation rivet 6. In the illustrated example, the blade assembly 5 comprises in a manner known per se a main rocker element 7, at one end of which a secondary rocker element 8 is articulated. The free end of the rocker 7 and the ends of the rocker 8 support, also in a manner known per se, a wiper element 9 made of elas-  
35       tomic material.

      It is to be noted that the arrangement described above of the blade assembly 5 could be different and correspond for example to that described and illustrated

in the Italian utility model application no. 53549-B/87 which has already been mentioned and in which a further spring lever is envisaged for the connection between the wiper blade 9 and the arm 2.

5           According to the invention, the arm 2 is sub-divided into two longitudinal sections 10, 11, of which the first bears the mounting head 3, and therefore constitutes the supporting element of the unit 1, and the second bears the blade assembly 5.

10           The section 10 is usually metal whereas the section 11 as well as the components 7 and 8 of the blade assembly 5 are made of pressed plastic material.

15           As is better illustrated in Figures 3 and 4, both the sections 10 and 11 of the arm 2 have a corresponding profile in the form of a channel. That end of the section 11 which is turned towards the section 10 is formed with an extension 12 of reduced cross-section which is inserted longitudinally, by means of a telescopic connection, into the cavity of the corresponding end of the section 10. On their respective lateral walls, the extension 12 and this end of the section 10 have corresponding holes 13, 14 through which a transverse retaining pin 15 engages. The pin 15 has centrally a circumferential groove 16 on which there engages by means of a snap connection an elastic fork 17 which is formed in a restraining element, which is also usually made of plastic material, inserted into the cavity of the arm 2. It will be clear that the fork 17 of the restraining element 18 prevents the pin 15 from sliding transversely to the arm 2.

20           In order to free the pin 15, permitting its removal and the separation of the two sections 10 and 11 of the arm 2, it is only necessary to disengage the fork 17 in relation to the groove 16 of the pin 15, by pulling the restraining element 18 towards the outside of the cavity of the arm 2. For the purpose of facilitating this manoeuvre, the restraining element 18 has a knurled grip part 19 which projects on the outside of the arm 2. This grip part 19 is formed with a central cavity 20, the

function of which is to avoid, in the functioning of the wiper unit 1, interference with the blade assembly 5 and in particular with the rocker element 8 of the latter. Furthermore, the restraining element 18 can have an integral lateral projection 19a [sic] which can be used, after having removed the element 18, to push the pin 15 towards the outside without the necessity of recourse to auxiliary tools (Figure 3a).

The alternative illustrated in Figures 5 to 7 is in general similar to the embodiment described previously, and only the differences will be described in detail, using the same reference numbers for the same or similar parts.

In this alternative, the section 10 of the arm 2 also has a cross-section in the form of a channel having turned in free edges 10a, and in the cavity of its end zone a resilient strip 22, which has a locking hole 23, is fixed by means of a rivet 21 [sic].

The other section 11 has a reduced extension 24 from which a locating projection 25 projects. The extension 24 is engaged telescopically in the cavity of the section 10 and is axially locked in relation to the latter through the effect of the engagement of the projection 25 in the hole 23 of the strip 21. As can be seen in Figure 5, the free end 26 of the strip 21 projects beyond the extension 24 of the section 11 and functions as a manoeuvring element, which is accessible from the inside of the cavity of the section 10, to deform elastically this strip 21 into the position represented in broken lines in Figure 5, so as to disengage the projection 25 from the hole 23 and permit the separation of the two sections 10 and 11.

Obviously the effects of the present invention extend to models which achieve similar utility using the same innovative idea.



CLAIMS

1. Wiper unit for windscreen-wiper devices for motor vehicles, comprising an arm (2) intended to be connected at one end (3) to a motorized control device and bearing at the other end a wiper blade assembly (5) which is permanently connected to the arm (2), characterized in that the arm (2) is sub-divided into two longitudinal sections (10, 11) connected to one another by means of an insertion-type joint and interconnected by removable restraining means (15, 18; 21).

2. Wiper unit according to Claim 1, characterized in that the two sections (10, 11) of the arm (2) have respective profiles in the form of a channel which are mutually engaged in a telescopic manner, and in that said removable restraining means consist of a transverse pin (15) for joining the two sections (10, 11), which is formed with a central circumferential groove (16) on which there engages by means of a snap connection an elastic retention fork (17) which is formed in a restraining element (18) inserted into the cavity of the arm.

3. Wiper unit according to Claim 2, characterized in that the restraining element (18) has a grip part (19) which is profiled in the form of a channel (20) and projects on the outside of the cavity of the arm (2), and possibly a lateral extension (19a) for manoeuvring the pin (15).

4. Wiper unit according to Claim 1, characterized in that one of the two sections (10) of the arm (2) has a profile in the form of a channel on the inside of which a retention element in the form of a resilient strip (21), which is provided with a locking part (23), is fixed, and the other section (11) of the arm (2) engages in a telescopic manner in this profile in the form of a channel and has a locating part (25) which engages in a removable manner said locking part (23) of the resilient strip.

5. Wiper unit according to Claim 4, characterized in

that said retention strip (21) has one end for manoeuvring (26) which is accessible from the cavity of said section (10) with a profile in the form of a channel in order to disengage said locking and locating parts (23, 25).

6. Wiper unit according to any one of the preceding claims, characterized in that the section (10) of the arm (2) bearing the end for connection (3) to the motorized control device is metal, and the other section (11) with the blade assembly (5) is made of pressed plastic material.

7. Wiper unit essentially as described and illustrated and for the specified purposes.